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10/534,623	12/27/2005	Seung-Woo Lee	6192.0582.US	5613

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EXAMINER	
MA, CALVIN	

ART UNIT	PAPER NUMBER
2629	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/534,623	LEE ET AL.	
	Examiner	Art Unit	
	CALVIN C. MA	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 March 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,7-13 and 15* is/are rejected.

7)☒ Claim(s) *6 and 14* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-5, 7-11, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. (US Patent: 7,030,846) in view of Stokes et al. (US Patent 6,628,828), further in view of Moon et al. (U.S. Patent 6,762,742).

As to claim 1, Lee teaches a liquid crystal display comprising:

a liquid crystal panel assembly (400);

a signal controller (100) have a bit number (i.e. 9 bits) greater than the input image data (i.e. 8 bit)a bit number (i.e. 8 bit), a color correction unit (112, 114, 116) including color correction coefficients for performing color correction on the image data from the gamma converter, the color correction coefficients determined depending on color represented by the liquid crystal display (i.e. since the RGB data correction units 112, 114 and 116 transform the input data to predetermined data being adapted to the characteristic of the liquid crystal, this means that there exist coefficients in these unite

that is depended on the actual liquid crystal color characteristic in the LC panel 400) (see Fig. 8, Col. 7 Line 65 - Col. 8, Line 7), and a dithering and FRC processor (122, 124, 126) reducing a bit number of the image data (9 bit) from the color correction unit by taking upper bits of the image data and controlling position and frequency of the upper bits of the image data (see Fig. 8, Col. 8, Lines 1-44);

a voltage generator generating a plurality of gray voltages by dividing a predetermined voltage lower than a supply voltage (i.e. data driver is able to output select voltages that are generated at the voltage generator, which include V_{on}, V_{off}, and V_{com}) (see Fig. 7, Col. 7, Lines 33-45);

a data driver receiving the gray voltages from the voltage generator and selecting data voltages among the gray voltages corresponding to the image data from the signal controller(i.e. data driver receives voltages from the understood voltage generator, since this voltage output is based of the gray scale RGB gray scale value they are gray voltage based on the combination of the V_{on}, V_{off}, and V_{com} Values) (see Fig. 7, Col. 7, Lines 33-45);

However, Lee does not explicitly teach including a gamma converter outputting output image data based on input image data have gamma characteristic adapted to a gamma 2.2 curve; such that a predetermined one of the gray voltages gives a luminance of about 80 cd/m^2; an inverter controlling a lamp to emit a luminance higher than 80 cd/m^2.

Stokes teaches including a gamma converter (104) outputting output image data based on input image data have gamma characteristic adapted to a gamma 2.2 curve (see Stokes Col. 7, Lines 20-21); such that a predetermined one of the gray voltages gives a luminance of about 80 cd/m^2; (i.e. in the SRGB standard the 80 cd/m^2 and 2.2 CRT Gamma is officially enumerated as the luminance level, see ITU-R BT.709) (see Stokes, Fig. 3, Col. 7, Lines 12-24).

Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to have used the sRGB gamma conversion design of Stoves in the overall signal controller of Lee in order to same computing time and speed up operations. (see Stokes, Col. 1, Lines 45-52).

The combination of Lee in view of Stokes, does not explicitly teaches an inverter controlling a lamp to emit a luminance and output data voltages to the liquid crystal display panel.

Moon teaches an inverter (62) controlling a lamp (64) to emit a luminance and output data voltages to the liquid crystal display panel (i.e. the inverter control modifies the output of the lamp depend on the V_{duty} input, and since the Lamp is part of the liquid crystal panel 400, the control data signal CTL_I is a data voltage that is applied to the liquid crystal panel) (see Fig. 11, Col. 13, Lines 10-50).

Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to have applied the inverter and lamp design of Moon in the overall LCD system of Lee and having it emit luminance higher than 80 cd/m^2 to

satisfied the gamma converter of Stokes (since in order to pass through the LC module and achieve 80 cd m^2, the lamp must achieve higher luminance) in order save power consumption and achieve backlighting performance(see Moon, Col. 2, Lines 1-12).

As to claim 7 and 11, see discussion of claim 1 above, claim 7 and 11 is analyzed to be broader in scope than claim 1 and is rejected on the same ground as claim 1.

As to claim 2, Stoke teaches the liquid crystal display of claim 1, wherein the gamma converter comprises an R data modifier, a G data modifier and a B data modifier for performing the gamma conversion for the input image data for respective red, green and blue colors, and each of the data modifiers maps the input image data into output image data having a gamma characteristic adapted to the gamma 2.2 curve (i.e. since the sRGB standard requires the change of gamma to the 2.2 setting, the input data must be change accordingly to fit the gamma 2.2 curve) (see Fig. 3, Col. 6, 1-5).

As to claim 3, Stoke teaches the liquid crystal display of claim 2, wherein the data modifiers include a nonvolatile memory (27) (i.e. the hard disk memory device 27 is nonvolatile memory) (see Fig. 1, Col. 3, Lines 15-16).

As to claim 4, Stokes teaches the liquid crystal display of claim 1, wherein the color correction coefficients are expressed in a 3.times.4 color correction matrix (i.e. since by definition a 5x5 matrix contains numerous 3 x 4 matrix, therefore the color correction coefficients are expressed in a 3 x 4 matrix as well).

As to claim 5, Stokes teaches the liquid crystal display of claim 4, wherein the color correction unit performs a matrix operation given by: (R_s G_s B_s) = M x (R_C B_C G_C 1), where M is the color correction matrix (i.e. since the 5 x 5 matrix when simplified for R G B solution can be arrived by M x (R G B 1) as the first row of A transparency can be ignored) (see Stokes, Fig. 4E).

As to claim 8, see discussion of claim 3 above, claim 8 is analyzed to be broader in scope than claim 3 and is rejected on the same ground.

As to claim 9, Lee teaches the liquid crystal display of claim 7, wherein the target image data storage includes a nonvolatile memory (ROM) in the signal controller and a nonvolatile memory element provided external to the signal controller (i.e. the read only memory control unit 130 is non volatile) (see Fig. 17, Col. 12, Lines 1-5).

As to claim 10, see discussion of claim 1 above, Stokes in view of Moon teaches the liquid crystal display of claim 1, wherein the gamma converter (i.e. the computer realizing the Gamma Correction operation 104) obtains the output image data from the input image data by way of a mathematical operation (i.e. the mathematical operation is applied when the transformation of data carried on a one-dimensional look-up table which requires mathematical operations to access and convert the digital data) (see Fig. 3, Col. 7, Lines 28-51).

As to claim 13, see discussion of claim 4 above, claim 13 is analyzed to be broader in scope in claim 4 and is rejected on the same ground.

3. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee in view Stokes, further in view of Moon as applied to claim 1-11, 13-14 above, and further in view of Brown Elliot et al. (US Patent: 7,221,381).

As to claim 12, teaches the method of claim 11, wherein the gamma characteristic conversion (i.e. step 104) includes a mathematical operation but does not explicitly teaches realized on an application specific integrated circuit (ASIC). Brown Elliot teaches gamma characteristic conversion realized on an application specific integrated circuit (ASIC) (i.e. performing pre-conditioning Gamma prior to rendering using ASIC) (see Brown Elliot, Fig. 52A, Col. 40, Lines 57-65).

Therefore it would have been obvious for one of ordinary skill in the art at the time the invention was made to have used the ASIC circuitry of Brown-Elliot inside the computer system of Stokes in order to allow precise control of gamma to provide high quality images (see Brown-Elliot, Col. 4, Lines 1-2).

Allowable Subject Matter

4. Claim 6, 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

5. Applicant's arguments filed 03/11/2008 have been fully considered but they are not persuasive.

Applicant argues in page 7-9 or response that Lee, Stokes, and Moon does not teach claim 1, more specifically Lee and Stokes does not teach "a bit number greater than the input image data" the examiner disagrees since Lee does recite the change of gamma curve in figures 9 and 15 and recites teachings of converting B gamma curve into a target gamma curve, in this way even though Lee does not use the name gamma converter Lee teaches the ideas of such and the color correction circuit is an implementation of this idea. Stokes is cited in combination with Lee to more clearly teach the Gamma converter and the Gamma 2.2 curve which Lee is silent on. In this way the limitation of a bit number can be any bit number used during the process of

conversion and since 9 bits are used in one of the steps, Lee and Stokes teach the said limitation.

Further more; the applicant argues that Lee does not teach voltage generator dividing a predetermined voltage which is lower than the supply voltage, the examiner disagree because the voltage generator of the entire display panel 400 also drives the data driver and because the limitation of claim 1 is not effective is linking the gray voltages to data driver, the voltage generator is Lee which provides voltages that enable a gray scales display can be considered as providing gray voltages since digital transmission requires at least two variable values, the voltages generator is capable of creating the high and low values to transmit the RGB gray voltages to the data driver to create the gray scale display.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Inquiry

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Calvin Ma whose telephone number is (571) 270-1713. The examiner can normally be reached on Monday - Friday 7:30 - 5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chanh Nguyen can be reached on (571) 272-7772. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Calvin Ma
July 3, 2008

/Chanh Nguyen/
Supervisory Patent Examiner, Art Unit 2629